Nova Scotia

ANNUAL REPORT

for the fiscal year
ending March 31, 1987

Department of the Environment

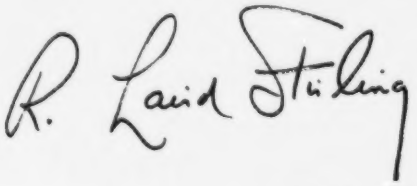
89-04906/

The Honourable Alan R. Abraham, C.D.
Lieutenant Governor
Province of Nova Scotia

May It Please Your Honour:

The undersigned has the privilege to present to your Honour the Annual Report of the Nova Scotia Department of the Environment for the fiscal year ending March 31, 1987.

Respectfully submitted



R. Laird Stirling
Minister of the Environment

The Honourable R. Laird Stirling
Minister of the Environment
Province of Nova Scotia

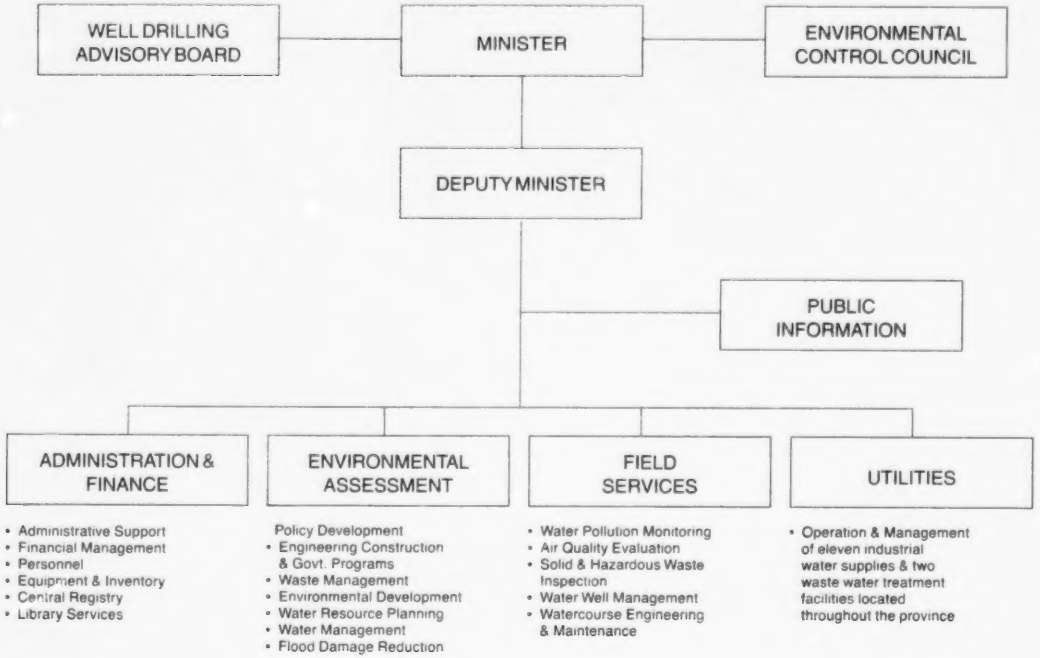
Sir:

I have the honour to present to you the Annual Report of the Nova Scotia Department of the Environment for the fiscal year ending March 31, 1987.

Respectfully submitted

A.H. Abbott, P.Eng.
Deputy Minister

DEPARTMENT OF THE ENVIORONMENT
ORGANIZATION 1986–87



CONTENTS

Page

Organization Chart 7
Introduction 10
Legislation 11
Environmental Assessment Division 12
- Waste Management Section 12
- Construction and Government Programs Section 13
- Environmental Development Section 14
- Water Resources Planning Section 15
- Water Management Section 16

Field Services Division 18
- Solid and Hazardous Waste Inspection Section 18
- Air Quality Evaluation Section 19
- Water Pollution Control Section 20
- Water Well Management Section 21
- Watercourse Engineering and Maintenance Section 24
- Provincial Stream Maintenance Program 25

Utilities Division 27

Administrative and Finance Division 28

General 29
- Environmental Emergencies 29
- Nova Scotia Environmental Control Council 29
- Well Drilling Advisory Board 30
- Canada-Nova Scotia Flood Damage Reduction Program 30
- Advisory Groups 31
- Meetings, Committees, Education and Technical Seminars 32
- Studies, Reports, Publications and Contributions to Outside Journals 33

Tables
- Spills Reports and Complaints 18
- Water Pollution Control Facilities, Nova Scotia, 1987 21
- Statistical Report, Water Well Drilling in Nova Scotia, 1986 23
- Cost-Shared Streambank Stabilization and Protection Program 25

INTRODUCTION

The Nova Scotia Department of the Environment was established in 1973 to provide for the preservation and protection of the Environment.

Under the Environmental Protection Act, the Minister has the responsibility to supervise and control the management, preservation, and protection of the environment and to provide the best use of renewable resources for the benefit of the people of the province.

The Department is divided into four divisions:

Administration, Environmental Assessment, Field Services, and Utilities. Administration/Finance provides administrative support services to the divisions.

Six provincial statutes are administered by the Nova Scotia Department of the Environment:

The Environmental Protection Act, the Water Act, the Well Drilling Act, the Beverage Containers Act, the Dangerous Goods and Hazardous Waste Management Act, and the Pest Control Products Act.

During the 1986–87 fiscal year, the Department saw increased activity in such phases of environmental protection as environmental assessment, industrial pollution abatement measures, municipal waste studies, and rapid response to special environmental problems.

The Department of the Environment's main office is in Halifax with field offices located in Sydney, Port Hawkesbury, Pictou, Truro, Middleton and Yarmouth.

Halifax	424-5300
Middleton	825-6246
Pictou	396-4194
Truro	895-9266
Port Hawkesbury	625-0791
Sydney	539-8515

LEGISLATION

Environmental Protection Act—This major piece of legislation charges the Department with the broad responsibility of the protection and enhancement of the environment.

Water Act—This Act gives the Minister the mandate to control and supervise all watercourses including the use, allocation, pollution or alteration of watercourses. Under the Act, the Department is responsible for approving all water rights applications in the province.

Well Drilling Act—The intent of this Act is to ensure an adequate standard of well construction for the protection and management of well water resources and also for the protection of consumers utilizing the services of well construction companies. The Department is therefore responsible for licensing well drillers in the province and for the inspection of wells dug or drilled.

Beverage Containers Act—The purpose of the Beverage Containers Act and regulations is to discourage littering of beverage containers, and promote the reuse of beverage containers.

Dangerous Goods and Hazardous Waste Management Act—This Act received Royal Assent during the 1986–87 fiscal year. The Act applies to the "handling of dangerous goods for any purpose and handling of hazardous waste on property owned by the person responsible for it, or elsewhere". It requires that persons responsible for dangerous goods or hazardous waste report to the Minister their location, approximate quantities, the reasons the dangerous goods are being kept, and precautions observed to ensure safe handling and storage.

Pest Control Products Act—The intent of this Act is to prevent pollution from occurring during any stage of the life cycle of a pesticide. This is achieved through a licensing system, permit system and regulations on use, storage, and handling.

ENVIRONMENTAL ASSESSMENT DIVISION

This division has five sections to carry out responsibilities in Water Management, Environmental Assessment, Pollution Control, and Solid and Hazardous Waste Management. The sections are:

Waste Management

This section has two main areas of responsibility: Solid and Hazardous Waste Management and Industrial Pollution Control.

Staff in this section work with industries and municipalities in planning for the development of pollution abatement facilities. Funding is provided to municipalities for such studies. In addition, an industrial review program ensures that industry complies with permit requirements.

Activities of the Waste Management Section were varied in this fiscal year:

A $34.3 million dollar federal/provincial agreement to clean up the Sydney Tar Ponds was signed on November 7, 1986. The agreement covers Phase 1 of the ten year, $50 million dollar project.

Assistance was provided to eight municipalities totalling $180 thousand dollars to study and develop plans for solid waste disposal facilities.

Cape Breton County—The first of two equal dispersements of $350 thousand was paid to the county for the development of a municipal incinerator. This unit has air pollution control equipment and is capable of burning 100 tonnes of garbage per day. The total cost of the project is $3.5 million dollars.

Annapolis County—A grant of $175 thousand dollars was given to the county for the development of an incinerator at Crisp Road. To date, 10 landfills and 3 incinerators have been developed under the solid waste assistance program. Seventy percent of municipal waste in Nova Scotia is now being handled by these new facilities.

In mining, the Waste Management Section worked with the Cape Breton Development Corporation in assessing and developing waste management strategies for a number of major projects. These include:

The Phalen Coal Mine, the Lifting/Banking Center and an effluent control problem at Victoria Junction.

An effluent control problem of a non-toxic nature was quickly and successfully overcome at Rio Algom Ltd.; this was accomplished through the efforts of the company, and the Provincial and Federal Departments of the Environment.

Construction and Government Programs Section

This section exists to ensure that during planning and construction of land developments, environmental concerns are addressed. In addition to permits for such projects, the section processes permits for Water Rights.

Subdivision Review—Over 600 subdivision applications from around the province were processed during the year. Part of the process is advice on erosion and sediment control measures, review of drainage plans and road profiles for the protection of receiving watercourses, as well as a close liaison with Department of Transportation staff to ensure that all roads, ditches, and drainage easement are environmentally acceptable before they are officially listed.

Other large land development proposals were reviewed and monitored including; the Aerotech Industrial Park near the Halifax International Airport and the Ragged Lake Industrial Park.

The section regularly reviews and advises on proposed parks for the Nova Scotia Department of Lands and Forests, such as the Long Lake and Dollar Lake sites.

Review of Installation of Water and Sewer Services—Approximately 160 applications were processed during the year. A total of 1.9 million dollars was granted to municipalities to assist in the construction of sewage collection and treatment systems.

This section has also been involved in a phased study program for Halifax Harbour. The latest report will provide information on costs of various systems for collection and treatment. This information will provide the basis for determining future treatment strategies.

Staff have participated in a committee of the Metropolitan Area Planning Commission to provide a computer model for the Halifax Inlet. It will be used as a tool for developing future treatment practices.

Within the past year the city of Halifax has made major changes in the mainland south sewage system, by decreasing overflows to MacIntosh Run. A new overflow retention tank is nearly completed which will further improve the situtation. A study was also completed for Herring Cove, which has recommended a primary treatment system and an extension to the present raw sewage outfall.

Highway Alignment and Utility Review—Staff reviewed five large projects submitted by the Nova Scotia Department of Transportation involving highway alignment. In addition, water rights for the same projects were completed with staff reviewing the adequacy of proposed drainage structures and erosion and siltation control measures. Highway construction projects worth approximately $12 million dollars were monitored to ensure construction was completed with environmental considerations addressed.

Environmental Development Section

This section has three main areas of responsibility:

Pesticides Management—This program processes permits for pesticide spraying. This includes field monitoring to ensure compliance with permit terms and conditions. The program also reviews types of pesticides, herbicides, and methods of spraying. Two hundred and ninety-two applications were processed under the Pest Control Products Act during the year. Of these, 262 applications were approved, 1 was rejected, 22 were recalled by the proponent and 4 were left on file.

Environmental Review—This program reviews the potential environmental impact of proposed developments. Recommendations are made on their environmental suitability and what, if any, modifications should be made to make the proposal more acceptable. Efforts continued to have Environmental Assessment Legislation drafted for Nova Scotia.

Environmental Studies—This program is directed toward the analysis of surface water quality and evaluation of the impact resulting from the introduction of substances to watersheds which could alter water quality. Environmental studies have traditionally focused on concerns relating to acid rain and problems/solutions associated with excess nutrients in lakes. The precipitation chemistry network of five stations across the province is being maintained. The data generated by this study will help evaluate whether reductions in emissions of sulphur dioxide in Eastern Canada and New England/New York will provide measurable improvements in the quality of precipitation and lakes.

Water Resources Planning Section

The Water Resources Planning section carries out its programs in two main areas:

Water Resources Inventory—With regard to inventory, staff carry out groundwater investigations listing groundwater tables that are in use and those that are undeveloped. This study and research is aimed at the protection of the provincial water supply. Stream gauging agreements with Environment Canda provide surface water flow data. A network of observation wells provides information on groundwater and logs of wells drilled in the province. This information is collected and filed for reference and form part of the data base.

Water Resources Planning Section—Staff in this section assist individuals, industry, municipalities and other government agencies by providing information and technical advice relating to quantity, treatment, development, and protection of water resources. An associated function is the assessment of proposed water use developments and waste disposal systems.

Staff in this section participated in the preparation of Canadian Water Quality guidelines which were issued by the Canadian Council of Resource and Environment Ministers. The guidelines address a number of major uses of water.

An action plan for implementing measures to improve the hydrologic networks of the province was adopted and several projects were undertaken. One such project was the drilling of seven observation wells in the following areas: Meteghan, East Jordon, Mill Village, Gold River, Sheet Harbour, Stillwater and North Grant.

Ongoing attention was given to problems posed by measurable levels of dry cleaning fluid in the municipal water resources for Amherst, New Minas and Truro. Numerous enquiries and requests for assistance came from other government agencies as well as industries and municipalities as individual water supplies appeared to be drying up.

Groundwater and soil contamination from leaking tanks in at least seven locations required attention. Problems occurred at Milton and White Point Road, Queens County, at Barrington Passage, Shelburne County, at Vogler's Cove in Lunenburg County and Bayside in Halifax County. A groundwater monitoring program was designed to monitor farm chemicals at a chemical warehouse fire site in Canning, Kings County.

Staff assisted the Department of Government Services on 13 projects including schools and nursing homes in need of a new or better water supply.

Water Management Section

This section has two main program areas:

Reviewing Water Rights—This section processes applications under the Water Act. These include permits and licenses relating to watercourse alteration and withdrawal of water for individual, municipal, industrial, agricultural, and other uses.

Of 409 applications received, 76 were for water use licences, which are required to allocate the resource between competing users. The remaining 333 applications were for permits to work in a stream or to alter a stream channel.

Watershed Management—The section also reviews applications from forest operators and private wood lot owners wishing to install bridges or culverts on forest access roads; 211 such applications were received in the fiscal year.

During the year, the Lake Major Watershed, which is the water supply for the city of Dartmouth, was designated a protected water area. The designation for the Mill Lake Watershed, which supplies the town of Windsor, was revised to include more of the watershed area and provide better regulations. The towns of New Waterford, North Sydney, Liverpool, and Mahone Bay also held discussions with the section to update designations of their water supply areas. Discussion also continued with the town of Antigonish regarding designation of their James River Watershed.

The Water Management Section also investigates a number of complaints from the public about damage to watercourses. Many of these complaints are associated with erosion causing siltation of the stream or illegal alterations to a watercourse and in filling around the shores of lakes.

FIELD SERVICES DIVISION

This division is responsible for provincial air monitoring stations, 24 hour response to environmental emergencies, oil spill prevention and clean-up co-ordination, water pollution control, inspection and monitoring of municipal, industrial and private solid waste disposal site practices, and supervision of the disposal of contaminated materials.

Solid and Hazardous Waste Inspection Section

This section is responsible for the ongoing inspection and monitoring program of municipal, industrial, and private solid waste disposal sites. It also inspects areas contaminated by oil or hazardous materials spills and supervises the disposal of contaminated materials. During the past year the section responded to 505 spill reports and complaints.

Spill Reports and Complaints

Petroleum Spills	385
Other Hazardous Materials	58
Solid Waste Dumping Complaints	61
TOTAL	504

The section was involved in a major chemical warehouse fire in Canning which resulted in the evacuation of almost the entire village for up to one week. The Department of the Environment co-ordinated the environmental response to the incident and supervised the clean-up of the site.

The section's hazardous material response training program for fire, police, and municipal officials continued into its third year and addressed over ninety fire departments across the province.

The section participated in a joint industry/government task force during the year. The objective was to develop a set of draft regulations for petroleum storage tanks. Draft regulations were developed and submitted for industry's comment.

The solid waste disposal site groundwater monitoring program continued into its fourth year. A total of 20 sites are included in the annual sampling program which now includes tests for PCB's, dry cleaning fluid—perchloroethylene and pesticides.

Air Quality Evaluation Section

The Air Quality Evaluation Section is responsible for the operation of three major ambient air monitoring networks in Halifax-Dartmouth, Port Hawkesbury, and Industrial Cape Breton. Two single air monitoring stations are also operated, one in Pictou and one near Kentville. A total of 22 continuous air quality monitors are operated as well as 16 total suspended particulate monitors. Monitoring is primarily for sulphur dioxide through nitrogen dioxide. Carbon monoxide and ozone are monitored in Halifax-Dartmouth. Hydrogen sulphide was monitored in Port Hawkesbury and ozone was monitored near Kentville.

A total of 217 complaints or inquiries concerning air or noise pollution were handled during 1986–87.

Thermal Power	2
Refining	14
Hospital Incineration	27
Founderies	1
Salvage Operations	25
Sandblasting	2
Open Burning	4
Noise	15
Odor	24
Wood Stoves	8
Smoke/Soot	6
Miscellaneous Sources	34
Enquiries	15
TOTAL	217

The survey of the environmental impact of coal dust from trucking operations at the DEVCO wash plant at Victoria Junction was completed. The results were reviewed with DEVCO officials who agreed to take action to reduce the impact from this operation.

The burning of coal tar in the open hearth at SYSCO was halted until major modifications were made to the system to ensure an environmentally acceptable burn. During this time, PAH monitoring was carried out to ensure that the operation doesn't have a detrimental environmental impact on the surrounding area.

This section provided representation on committees to oversee the environmental aspect of the SYSCO modernization plan and the Tar Ponds Clean-up project.

Water Pollution Control Section

The Water Pollution Control Section staff operate out of the regional offices of the Nova Scotia Department of the Environment. The primary task of the section is controlling, reducing or monitoring water pollution, and preventing such pollution when possible. Over 12 hundred telephone inquiries were received by this section during the year.

Staff from this section inspect the operation of water and wastewater treatment plants in Nova Scotia to examine whether they are performing up to the standards specified when the appplication was made. If a significant deviation is identified, a formal evalution is carried out and the owner is informed—either through formal advisement or a Ministerial Control Order—that changes in the operation are required. A deadline for the indicated action is set and any variances from the terms and conditions imposed upon the owner are subject to prosecution under the terms of the Water Act or the Environmental Protection Act.

Over 50 industries or municipalities in the province are required to do self-monitoring of various parameters and effluents and report the results to the section. They are then evaluated and follow-up, re-inspection, or upgrading of standards may be indicated.

This section, in co-operation with the Environmental Protection Service of Environment Canada, undertook a program called FEDSAMP, in which over 40 industrial pollution discharges were sampled. When a problem was identified, an appropriate response was undertaken.

The section provides laboratory services to owners and operators of treatment facilities. These laboratories are located in the field offices.

Staff in this section carried out over 15 hundred regular treatment plant inspections through the year and identified the areas in the province which require wastewater treatement plant upgrading, or those that need waste treatment.

The section supports the Maritime Provinces Water and Wastewater Operators Association by participating in their Annual Training Seminar. In conjunction with the Department of Health, the section offers various training programs and an annual operators school. During the year, over 100 operators took advantage of the various training opportunities and 208 people attended the Operators Seminar in Truro.

The table below lists the number and distribution of the various wastewater treatment plants which are inspected by this section.

WATER POLLUTION CONTROL FACILITIES, NOVA SCOTIA—1987

County	Municipal	Industrial	Totals
Annapolis	8	2	10
Antigonish	9	0	9
Cape Breton	21	9	30
Colchester	17	3	20
Cumberland	20	2	22
Digby	9	0	9
Guysborough	10	0	10
Halifax	71	11	82
Hants	21	0	21
Inverness	20	0	20
Kings	15	3	18
Lunenburg	28	2	30
Pictou	19	2	21
Queens	8	0	8
Richmond	10	5	15
Shelburne	9	0	9
Victoria	12	1	13
Yarmouth	10	1	11
TOTALS	317	41	358

All waste treatment facilities are monitored on a regular basis, the schedule varies with the sensitivity of the discharge situation and the size of the facility.

Water Well Management Section

The Water Well Management Section is responsibile for administering the Well Drilling Act, through management of groundwater resources.

Sixty percent of Nova Scotians rely on groundwater for their water supply. The well drilling industry employs about 200 people directly and 100 people indirectly. In the 1986–87 fiscal year, staff answered over 550 inquiries and 3,000 new wells have been constructed.

The Water Well Management section has assisted on several large water well construction projects in the past year for the town of Amherst, the town of Springhill, Hostess Foods, and several large fish plants. Water wells have been constructed and pumping tests carried out for the Nova Scotia Departments of Lands and Forests, Housing, Transportation, and various hospitals, farms, and senior citizen buildings.

WATER WELL DRILLING IN NOVA SCOTIA

1986

Number of Wells Drilled

Observation	6
Industrial	31
Public	9
Domestic	2935

Number and Kind of Equipment is Full or Part-time Use

Cable	31
Rotary	40
Backhoe	50
Jetting	1
Diamond	Nil

Number of Men Employed Full or Part-time 233

Pump Tests Assisted On 21

Number of Accidents, Including Diamond Drilling

Fatal	0
Compensable	3
Medical Aid	N/R

Licenses Issued

Drilling	55
Backhoe	50

Complaints and Inquiries in Writing

Complaints	103
Inquiries	207

NOTE: In addition to this, phone calls and personal visits responded to during the year totalled over 560.

Water Samples

Well and Stream	151

The Water Well Management Section is now using a new mapping report form system which will be invaluable in obtaining more concise information from water well contractors. Staff have also been involved in several interprovincial and intergovernmental meetings—concentrating on new construction methods, new equipment, and water well contractor training.

Staff participated in making the Atlantic Water Well Convention School in P.E.I. a success. The session was well attended by Nova Scotia contractors.

In May, 1988 the Canadian Water Well Association National Convention and School was held in Halifax. The General Chairman and the Technical Chairman for the convention were selected from staff in this section.

The Nova Scotia Well Drilling Advisory Board is considering a licencing program for pump installers in the province and a joint water well contractor training program in co-operation with the Province of New Brunswick. As well, the Advisory Board has finalized changes to the Well Drilling Act and will now submit those changes to the appropriate officials for review.

Watercourse Engineering and Maintenance Section

This section provides response to a number of environmental concerns, complaints, and inquiries such as; oil spills, watercourse damage, odour problems, flood and monitoring and ice and snow sampling.

Located in Truro, this section's primary function is delivery of the cost-shared Streambank Protection Program and the provincially funded Streambank Maintenance Program.

COST-SHARED STREAMBANK STABILIZATION AND PROTECTION PROGRAM

County	No. of Projects	Cost
Antigonish	3	$12,003.01
Colchester	3	$10,286.13
Cumberland	1	$ 3,172.38
Inverness	4	$23,456.01
Victoria	2*	$ 4,773.85
TOTAL		$53,691.38

* One of these sites was only partially completed.

Landowners affected by these projects contributed twenty-five percent of the cost to a total of $14,318.77.

PROVINCIAL STREAM MAINTENANCE PROGRAM

Chiganois River $9,835.30

An 800 foot section of the river channel was realigned and reinforced. Alignment problems caused the channel to meander, and erode the reach, which is adjacent to fertile agricultural property.

North River $11,355.43

A 400 foot section of the riverbank and berm was reestablished and reinforced against erosion. This area of the river, near the Will Kare gravel pit, was destabilized during a dredging project. Erosion of this channel bank and berm was causing downstream alignment problems. If left, the river would have eventually broken through the berm, entering the pit area, and threatening residential properties on Gloendate Drive.

Middle River Phase II $8,982.00

The section of the Middle River from Middle River to Yankee Line exhibits a variety of channel conditions ranging from excellent to almost non-existent. This system is flashy with new channels being cut and high bed load movement. To keep the river in one channel and prevent flood damage to several hundred acres of newly planted seedlings behind Middle River Motors, a 2900 foot reach of river required restoration. Due to the scale of this project, which entailed gravel bar cropping, some channelization,

and extensive bank protection, the work was planned in two phases. In 1985/86 Phase I of the project commenced with approximately 1900 feet of channel and bank stabilization work completed. This fiscal year Phase II was carried out with the remaining 1000 foot section of channel improved and stabilized.

Little River Channel Outlet $1,349.00

At the request of our Utilities Division, staff completed a cleanup of the section of Little River immediatley below the dam extending downstream to Highway 104. Large timber harvesting equipment was employed to remove several hundred trees, stumps, and debris. This was followed by a detailed site survey and plan preparation. A new channel design was prepared which would restore the area and provide protection against further erosion. Staff also negotiated approval for the proposal with Federal Department of Fisheries and Oceans.

Fred Davison Pond $13,842.24

Staff completed the reconstruction of the Davison Pond with two outlet control structures, and a treated-timber pump platform. The outlet structures are designed and located in such a way that water can be released to Mr. Frank Ansems' pond as required. A 100 foot length of 4 inch perforated drain was laid and backfilled with washed stone between the pond and the Karnan Ells property, to intercept drainage and convey it to the brook.

UTILITIES DIVISION

This division is responsible for the operation and management of all provincially-owned industrial water supplies and waste treatment facilities. These utilities provide necessary services to major industries in the province, including fish processing plants and pulp and paper mills.

The division is also responsible for identifying and protecting potential industrial and municipal water supplies and for designing, installing, and recommending major renovations and alterations.

The division operates and maintains eleven water supply stations, one domestic sewage treatment plant and one industrial waste treatment facility.

Water pumping stations include salt water supply plants at Grand Etang and Lockeport, fresh water supplies at Cheticamp, Port Hawkesbury, Canso, Pictou, Chester, Riverport, Lockeport and Middle and Lower East Pubnico. A treated fresh water supply system is maintained in Lockeport.

The Melford Brook Reservoir System in Guysborough County is now used as the water source of a privately-owned electrical generating station.

Major repairs and rebuilding were carried out at the Landrie Lake Dam, Port Hawkesbury, the Pictou pipeline and the East River fire pump.

ADMINISTRATION AND FINANCE DIVISION

This division provides support services to the other divisions in the Department of the Environment. Included are financial services and administrative financial support. The four activity centers of this division are:

Office of the Minister and Deputy Minister—This office provides executive management to the department and liaison with municipal, provincial, and federal agencies. It also makes recommendations to the Provincial Cabinet on environmental policies and legislation.

Information and Education Services—This activity promotes a public awareness of environmental issues through an education program. Staff here answer public telephone inquiries and inquiries from the media.

Administrative Support Services—The administrative and financial support functions provided by this activity include: accounting, personnel, central filing, central stationery and inventory control, as well as day-to-day management of the operations of the office facility and equipment. Also, a specialized environmental library-research facility is maintained for use by educational institutions, consultants, industry, and other government agencies.

Offshore Oil & Gas Development Review—This office had been providing a coordinated review and environmental assessment of oil and gas development. Within the fiscal year, this activity was moved to Assessment.

GENERAL

Environmental Emergencies

In this province, all oil or chemical spills must be reported. This department co-operates with all other provincial and federal departments to ensure a coordinated and integrated response to all spill incidents. To make a report in the Halifax/Dartmouth metroplitan area, phone 426-6030, or Zenith 49000 from elsewhere in the province. These numbers connect to the 24 hour operator at the Canadian Coast Guard Traffic Center in Dartmouth.

Nova Scotia Environmental Control Council

This is an advisory board to the Minister of the Environment. The council is made up of 12 to 15 citizens, representing the interests of the environment and the general public in resource decisions. Membership includes representation from the fields of health, law, engineering, industry, labour, municipalities, conservation or ecology groups, agriculture, academic, forestry and fisheries. The council has the support of an executive secretary and a research coordinator. The Deputy Minister of the Environment is an ex-officio member of the council.

Each year the council offers awards in recognition of outstanding environmental service. The categories are: individual, groups, organizations, education, youth, government and industry. Information on the awards program and a copy of the council's annual report can be obtained by writing to:

The Executive Secretary
Nova Scotia Environmental Control Council
P.O. Box 2107
Halifax, Nova Scotia
B3J 3B7

Phone 424-5300

Well Drilling Advisory Board

This industry/government advisory board was established under the Well Drilling Act and provides advice to the Minister on regulations and standards for the industry. The board meets regularly to discuss well drilling and related problems and helps the department examine applications and qualifications and makes subsequent recommendations for licencing under the Act.

Canada-Nova Scotia Flood Damage Reduction Program

Nova Scotia entered into this program with the Federal Government in June, 1978. The program is shared between the two levels of government and attempts to reduce damage caused by flooding in Nova Scotia. This is achieved by the mapping of flood prone areas, the study of flooding problems to determine the cost of remedial methods, recommendations on measures to reduce or prevent damage, and a steady flow of information to the public to restrict private and public development in areas that are prone to flooding.

This program is supervised by a Steering Committee appointed by the provincial and federal ministers of the environment. Technical committees oversee the mapping and studies which are usually done under contract by consulting engineers. Representation on the technical committees comes from several provincial and federal government departments.

The current agreement expires in 1994. For information on this program, or copy of the annual report, contact:

Environment Canada
Inland Waters Directorate
4th floor, Queens Square
45 Alderney Drive
Dartmouth, Nova Scotia
B2Y 2N6

Phone: (902) 426-3266

Nova Scotia Department
of the Environment
5th floor,
5151 Terminal Rd.
Halifax, Nova Scotia
B3J 3B7

Phone: (902) 424-5300

Advisory Groups

Petite Riviere Watershed Advisory Group—This group was formed by the department in 1977 in response to a number of water related problems in the Petite Riviere system in Lunenburg County. The Advisory Group consists of volunteers and was set up to advise the province on problems and solutions to water quality and flows in the watershed of Minamkeak Lake, Leipsigate Lake, Hebb Lake, Fancy Lake and the Petite Riviere system.

Information on the project and activities of this Advisory Group and meeting dates can be obtained by contacting:

Chairman
Petite Riviere Advisory Group
c/o Lunenburg County District Planning Commission
P.O. Box 341
23 Pleasant St.
Bridgewater, Nova Scotia
B4V 2N9

Phone: (902) 543-8244

Queens County Medway-Mersey Watershed Advisory Group—This group was set up in the spring of 1984 and advises the Minister on problems related to water quality and flows in the Medway-Mersey River systems in Queens County. Membership in this group is voluntary with representation from Queens County Council, the Town of Liverpool, Queen's County Fish and Game Association, the Nova Scotia Salmon Association, the South Shore Environmental Protection Association, the Nova Scotia Guides Association, the Queens County Tourist Associaton, Bowater Mersey Ltd., the North Queens Historical Society, and the Liverpool-Queens Development Commission.

Meeting dates and information relating to the Advisory Group can be obtained by contacting:

Chairman
Queens County Medway-Mersey
Watershed Advisory Group
c/o Queens County Planning Department
P.O. Box 1264
Liverpool, Nova Scotia
B0T 1K0

Phone: (902) 354-5741

Sable Island Advisory Committee—The Department participates on this committee to advise the Federal Department of Transportation on environmental matters related to Sable Island.

Meetings, Committees, Education, and Technical Seminars

Staff at the Nova Scotia Department of the Environment were involved in a number of committees during the fiscal year, giving representation and presentations.

Tar Ponds Clean-up Committees
Chairmanship at a Workshop on Acid Mine Drainage
Special Places Protection Act Advisory Committee
Deputy Minister's Committee on Land Use Policy
Development of Pyritic Slate Committee
Subdivision Review Committee
Intergovernmental Environmental Review Committee
MAPC Steering
Committee for Harbour Cleanup
Environment/Health Committee
The Waverly Area Environmental Standards Committee
Interdepartmental Committee on Uranium
Environmental Committee of the New England Governors and Eastern Canadian Premiers
Steering Committee of the Canadian Environment Ministers Municipal Sewage Effluent Quality Subcommittee
Canadian Council of Resource and Environment Ministers Water Advisory Committee
Nova Scotia Climate Advisory Committee
Nova Scotia Well Drillers Advisory Board
Sysco Modernization Plan Committee
Canadian Well Water Association

Staff within the Department also participated in a number of educational programs throughout the fiscal year:

The Atlantic Well Water Convention and School
Maritime Provinces Water and Wastewater Operators Association Annual Training Seminar
Atlantic Canada Voluntary Certification Program for Municipal and Wastewater Facilities, Water Distribution Systems, and Wastewater Collection Systems
The Department's Acid Rain Display was loaned to the Biology Department of Dalhousie for several months.
Environmental Mediation Seminar

Studies, Reports, Publications, and Contributions to Outside Journals

- Milton/Brooklyn, and Dayton/Hebron and Enfield/Lantz corridor studies have been completed, with funding from the department, regarding sewer and water upgrade feasibility.

- "Acidification of Nova Scotia lakes." III. Atmospheric deposition of SO_4, and NO_3 and effects on rural and urban lakes. 1987. J.K. Underwood, J.G. Ogden III, J.J. Kerekes, and H.H. Vaughan. *Water, Air and Soil Pollution,* Vol. 32, 77–87.

- "Fish species distribution and water chemistry in Nova Scotian lakes." D.L. Smith, J.K. Underwood, J.G. Ogden III and B.C. Sabean. *Water, Air and Soil Pollution* 30 (1986): 489–496.

- "Contemporary chemistry of Nova Scotian lakes." J.K. Underwood, J.G. Ogden III, and D.L. Smith. *Water, Air and Soil Pollution* 30 (1986) 991–999.

- "Natural and anthropogenic causes of lake acidification in Nova Scotia." E. Gorham, J.K. Underwood, F.B. Martin, and J.G. Ogden III. *Nature* 324 (6096): 451–452 (December 4, 1986).

- "Estimation of states of eutrophication by comparison of phosphorus loading secchi transparency and oxygen depletion rates in several Shubenacadie headwater lakes," with P.Y. Schwartz and J.K. Underwood. *Proceedings of the Nova Scotia Institute of Science* (1986) 36:13–26.

- "Environmental Status of several Shubenacadie River headwater lakes, Nova Scotia, Canada." A. Mudroch, T.A. Clair, J.K. Underwood and P.Y. Schwartz. *GeoJournal.* 14.3 (1987) 311–317.

- "Acidic lakes in Nova Scotia: Estimates of numbers and areas." J.K. Underwood and P.Y. Schwartz. Departmental Report—1986.

- Leydon, J.J. "Sydney Tar Pond Clean Up." Paper presented to the annual meeting of the Atlantic Chaper of The Air Pollution Control Association, Halifax, Nova Scotia, May 22, 1986; 19p.

- Travers, I.C. and Leydon, J.J.; "The Sydney Tar Ponds Remediation Program." Paper presented to the 8th Canadian Waste Management Conference, Halifax, Nova Scotia, September 1986; 11p.

- Leydon, J.J.: "Mining and Steel Production in Nova Scotia—Environmental Impacts," Paper presented to the Society of Certified Engineering Technicians and Technologists of Nova Scotia, Sydney, Nova Scotia, November 24, 1986.

- Leydon, J.J.; "Mining and a Major Hazardous Waste Development in Nova Scotia—An Environmental Perspective." Paper presented to the graduating class of the Technical University of Nova Scotia, March 1987.

For more information on previous produced publications, contact:

Nova Scotia Department of the Environment
P.O. Box 2107
Halifax, Nova Scotia
B3J 3B7